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TITLE: Hazardous Material Packaging and Shipping

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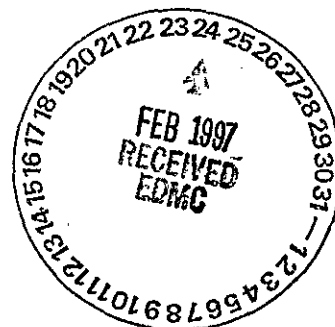
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## IMPLEMENTATION NOTICE

T&P recently reorganized and function responsibilities were consolidated and reassigned. Expanded coverage of the packaging function and requirements have been included to address recent changes in regulatory guidance. Other changes in group responsibilities have been addressed with elimination of some previous requirements due to recent changes in the QA program. Information in Packaging Total Hazad Index (THI) was recently included to provide more definitive guidance in nuclear packaging requirements. Major changes in text have reflected elimination of RL Orders and subsequent guidance provided by RL. New DOE orders are reflected while the orders they replace are still included and are subject to audit until such time that they are fully reflected and signed off in the contract. At that time they will be removed. The Radioactive Shipment checklist was removed and has been moved to Part IV consolidating information into appropriate sections. A site map has been added to further clarify offsite/onsite application as they apply to DOT regulations and DOE implementation



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## 1.0 RESPONSIBILITIES

Rust Federal Services of Hanford (RFHS) has responsibility for developing and maintaining a comprehensive program for the packaging and transportation of all hazardous materials and wastes for the Hanford site. Oversight of this program is assigned by Fluor Daniel Hanford (FDH) as directed under the provisions of the Project Hanford Management Contract (PHMC) with the U.S. Department of Energy. This comprehensive program complies with the requirements identified in U.S. Department of Energy (DOE) Order 460.1, (which canceled 5480.3) 460.2, and U.S. Department of Energy, Richland Operations Office guidance letter 95-SWT-186, (which provided guidance upon cancellation of RL 5480.1, Chapter III,) and their referenced documents. RFHS ensures that hazardous materials are prepared, packaged, and transported in a safe manner that will not present a hazard to the health and safety of site personnel or to the public and that transportation activities comply with all regulatory and DOE requirements.

The organizational responsibilities defined to carry out the hazardous material packaging and shipping program commitment are shown below.

### 1.1 Transportation and Packaging

The Transportation and Packaging (T&P) organization is assigned per charter and provisions in the contract for overall responsibility for implementation and review of Federal, State and DOE regulatory compliance activities for onsite and offsite shipments of materials, which includes hazardous materials, Federal Motor Carrier Safety Regulations, and applicable international standards. T&P responsibilities include overall guidance for implementing and maintaining the shipping and receiving program, as identified in the WHC-CM-1, *Company Policies and Charters*.

T&P also:

1. Obtains formal interpretation of transportation regulations from the appropriate federal agencies through RL.
2. Responds to RL inquiries concerning the overall packaging and shipping program.
3. Obtains formal interpretations of package design and test criteria from the appropriate federal agencies through RL.
4. Responds to inquiries from RL concerning all package design, testing, evaluation, or approval activities.

#### 1.1.1 Transportation Logistics

1. Serves as point of contact for the hazardous material shipping program at the Hanford Site.
2. Provides technical support to hazardous material and hazardous waste shippers.

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3. Reviews operating organization procedures for hazardous material transportation applications.
4. Coordinates transportation and packaging campaign planning.
5. Coordinates all radioactive material shipments that require road closure when packages approved only for onsite use are transported over or across public access roadways on the Hanford Site. Transportation Logistics also controls the approved transportation plan that outlines requirements associated with these shipments.
6. Inspects nonradioactive hazardous waste shipments. This includes inspection of packaging, vehicle, and review of drivers qualification including valid Commercial Driver's License (CDL), proper endorsements, and current medical certificate.
7. Reviews Hanford Site intra-area and inter-area radioactive shipment records to ensure compliance with applicable regulations as per applicable department procedures.
8. Maintains the system for issuing and controlling all routine shipment records.
9. Coordinates occurrence reporting of transportation and packaging reportable occurrences as required by WHC-CM-1-5, Section. 7.1, "Occurrence Reporting and Processing of Operations Information."
10. Provides overall management responsibility of inbound and outbound offsite shipments of hazardous material and waste.
11. Supports U.S. Department of Energy-Headquarters (DOE-HQ) transportation programs, including coordination of DOE's Motor Carrier Evaluation Program and development of automated transportation management system.
12. Prepares formal training courses and provides instruction to qualify personnel from other DOE sites in the proper procedures for authorizing/certifying hazardous material and waste shipments according to DOT, DOE, EPA, and other applicable regulations.
13. Supports DOE-HQ institutional programs and activities.
14. Verifies compliance with federal/state regulations, DOE Orders, and company requirements for all inbound and outbound offsite shipments of hazardous material, samples and waste for the Hanford Site.
15. Performs a pre-release inspection of each outbound shipment including reviewing the shipping records for compliance with DOE orders and other applicable regulations, requirements, and directives relative to the classification, description, packaging, marking, labeling, and tie-down of packages and certifying to the carrier that such packages and vehicles leaving the Hanford Site are in proper condition for transport. Driver qualifications are reviewed including valid CDL, proper endorsements and current medical certificate.

16. Provides for temporary storage in the 1100 Area at the Hanford Site for certain inbound and outbound offsite hazardous material shipments.
17. Receives, verifies compliance, and forwards inbound hazardous material shipments from offsite to their final onsite destination.
18. Supports development of transportation Automated Data Processing (ADP) applications.

### 1.1.2 Packaging Engineering

1. Provides Hanford site direction on packaging selection, maintenance, and use.
2. Coordinates DOE-TMD packaging development.
3. Performs packaging needs assessments for both onsite and offsite customers.
4. Supports T&P packaging program management, budget, schedule, milestones, and reporting to DOE-HQ.
5. Prepares and maintains the WHC-SP-0364, *Hazardous Materials Packaging Directory*.
6. Responsible for Container Management Program.
7. Processes special requests for special case waste and lab sample packaging systems.
8. Provides packaging operations interface for onsite and offsite programs.
9. Involved with procurement support of Performance Oriented and Type A Packagings.
10. Responsible for DOE-HQ explosives classification management and procedures.
11. Responsible for DOT Specification 7A package testing. Completed packaging testing data can be found in DOE/RL-96-57. (Can be found on the T&P internet home page @ <http://www.hanford.gov/pss/t&p/dot7a/ptoc.htm>).
12. Provides packaging program planning and development for site activities.
13. Provides on-call customer support for hazardous material packaging activities.
14. Performs searches for available onsite and offsite hazardous material packages.
15. Prepares and maintains safety analysis documentation for packaging (Safety Analysis Report for Packaging [SARPs], Safety Evaluation for Packaging [SEPs], Documentation & Analysis of Packaging [DAPs],) and DOT exemption requests. Maintains Certificates of Compliance (COC) for radioactive material packages used by Hanford contractors.
16. Designs hazardous materials packaging systems for onsite and offsite use. Provides cognizant engineers for approved packaging.

17. Prepares packaging design criteria and procurement specifications for onsite and offsite radioactive material packaging.
18. Prepares technical evaluation documentation for hazardous material packaging, including tiedown, content analysis, and DOT certification.
19. Facilitates technical development interface with customers.
20. Reviews procedures for safety analysis documentation of package regulation compliance.
21. Develops onsite packaging safety methodologies. Performs packaging design analysis including: structural, thermal, shielding, criticality and containment documentation.
22. Maintains documentation for special form material and packagings.
23. Approves engineering documents when the design affects radioactive/hazardous material shipping container design according to WHC-CM-3-5, Section 12.7.
24. Conducts qualification testing of Type B and Fissile material packaging to conform to applicable codes, standards, and regulations.
25. Responsible for packaging procurement, services outsourcing, and contract management.

#### 1.1.3 T&P Business Management and Special Programs

While tasked primarily for program tracking, scheduling and budget management activities for the T&P organization, the group also provides site related regulatory and transportation functions for facilities on the Hanford site through the following services:

1. Coordinates transportation technology transfer and work for other entities outside of RFHS, such as site packaging operations and development including facility assessments, logistical studies, and other transportation services.
2. The T&P Rapid Response Team is comprised of highly qualified engineers and specialists able to assist site customers who have immediate transportation and Packaging related needs and questions and don't know who to contact. A quick response will be provided by the appropriate function within T&P.
3. Responsible for the site container management and procurement support.
4. Coordinates and maintains the explosives management program for the DOE complex
5. Developed and maintains the DOE complex FAXBACK system for information disbursement and retrieval providing quick access to regulatory, design, lessons learned, and package testing information.
6. Coordinates within the department, Special projects and Self-assessments.

7. Prepares and maintains this manual, the Quality Assurance Program Plan (QAPP) for Transportation, and supplies input into the WHC-CM-1, *Company Policies and Charters*, "Transportation and Packaging."
8. Provides transportation and packaging regulatory change communication and interpretation to hazardous material and hazardous waste shippers.
9. Prepares formal training courses and provides instruction to qualify onsite personnel in the proper procedures for authorizing/certifying hazardous material and waste shipments according to U.S. Department of Transportation (DOT), DOE, U.S. Environmental Protection Agency (EPA), and Washington State regulations.
10. Performs generator and disposal contractor assessments for hazardous waste transportation and packaging applications.

## 1.2 Operating Organizations

The operating organizations include any group that uses, processes, generates, or transports hazardous materials. They are responsible for the following:

1. Managing onsite shipments of hazardous material originating at the operating facilities and making shipments in compliance with requirements and procedures established in this manual. Requirements include checking driver qualifications for current CDL, applicable endorsements and medical certificate.
2. Coordinating with Transportation Logistics, all planned inbound and outbound offsite shipments of hazardous materials, including radioactive materials.
3. Notifying Transportation Logistics of pending radioactive material shipments that require road closure to transport packages approved only for onsite use over public access roadways on the Hanford Site.
4. Preparing written operating procedures incorporating applicable safety analysis and Quality Assurance (QA) documentation requirements to be used for the packaging, loading, transporting, and unloading of hazardous materials.
5. Packaging, loading, transporting, and unloading hazardous materials in approved packagings, as specified by approved procedures and instructions. Further guidance is provided in RFS-IP-0705, *Quality Assurance Program Plan for the Hazardous Materials Transportation and Packaging Program*.
6. Transporting repetitive onsite shipments incidental to production (such as samples and waste) on vehicles assigned to the operating organizations.
7. Requesting transportation system and packaging development, design and procurement support. Packaging Engineering (PE) should be contacted prior to starting a packaging system and/or preparation of safety analysis documentation.

8. Ensuring only appropriately trained and qualified personnel are used to inspect, load, monitor, certify, authorize, and/or commercially licensed to transport hazardous material packages.
9. Visually inspecting the vehicle used to transport hazardous material for obvious defects and the vehicle inspection tags or papers to ensure the required preventive maintenance is current.

### 1.3 Environmental Health and Safety

1. Provides health physics support for all hazardous material packaging and transportation activities.
2. Ensures as low as reasonably achievable (ALARA) practices are utilized in the packaging and shipment of radioactive material.
3. Reviews and approves applicable documents relating to the packaging and shipping of hazardous materials. Approves all documents relating to occupational safety items or hazards.
4. Maintains surveillance of packaging and transporting operations to ensure adherence to the technical and safety aspects of the program and provide verification where applicable.

### 1.4 Quality Assurance

1. Assists in the development, implementation, and maintenance of a QA program for the packaging and transporting of hazardous material that addresses the fabrication, testing, assembly, maintenance, repair, and use (including reuse) of approved packagings.
2. Reviews and approves shipping package procurement documentation to ensure compliance with applicable policies and procedures, DOT and U.S. Nuclear Regulatory Commission (NRC) Regulations and DOE orders.
3. Reviews and approves plans, facility procedures, safety analysis documentation, drawings, and specifications related to hazardous material packaging and transporting.
4. Inspects shipping packages procured from outside sources and those fabricated onsite, including the verification of package qualification tests.
5. Inspects reusable packages for integrity verification as required by safety analysis documentation.
6. Conducts periodic audits and surveillances to assess program compliance with applicable codes, standards, and requirements.

### 1.5 Safeguards and Security

1. Establishes security requirements for onsite shipments of radioactive material including special nuclear material (SNM) shipments.
2. Establishes requirements for nuclear material accountability procedures.

### 1.6 Procurement

1. Procures shipping packages requested by operations organizations from approved suppliers.
2. Reviews all procurement requests for shipping packages.
3. Receives shipments from offsite origins and supports the continued transportation to onsite destinations as appropriate.

### 1.7 Environmental Safety & Health Training

Provides guidance and assistance in developing training and qualification programs for organizations involved in packaging and transporting of hazardous wastes.

### 1.8 Waste Management Services

1. Maintains liaison with originators of radioactive waste material shipments and coordinates approvals required to package and transport these materials for waste burial, interim storage, analysis, or processing.
2. Prepares and maintains manuals that describe packaging requirements for storage and disposal of hazardous waste (see WHC-EP-0063 and WHC-CM-5-16).

### 1.9 Transportation & Waste Handling

1. Transports hazardous materials shipments using dedicated or special equipment, according to applicable regulations. Copies of DOT's Emergency Response Guides are to be kept in the motor vehicles hauling hazardous materials.
2. Provides qualified, licensed vehicle operators who are familiar with their vehicles, tiedown procedures, and transportation requirements. Provides required information to maintain driver qualification files as required by the Federal Motor Carrier Safety Regulations. Ensures that vehicle operators who transport hazardous materials are qualified by successful completion of applicable site Hazardous Materials Training. Vehicle operators who operate a Commercial Motor Vehicle and require a valid CDL, must have proper endorsements and current Medical certificate on file, and in their possession when on-duty.
3. Provides safe and well-maintained vehicles for transport of hazardous materials. These vehicles must have current Class A/B or equivalent preventive maintenance inspections.

Ensures that the individuals performing annual inspections under 49 CFR 396.17 are qualified per 396.19 and 396.25.

### 1.10 Emergency Preparedness

1. Provides requirements for contractor emergency response to transportation accidents involving DOE-owned Hazardous Material shipments on and off the Hanford Site.
2. Develops and maintains implementing procedures for contractor response to transportation accidents involving DOE-owned Hazardous Material shipments on and off the Hanford Site.
3. Provides support to DOE-HQ on emergency preparedness matters related to transportation.

## 2.0 REQUIREMENTS

### 2.1 Delegation and Approvals

#### 2.1.1 Delegation and approvals for site authorized shippers

Site authorized shippers are employees delegated the responsibility by their respective managers to receive appropriate training and assume the responsibility for shipping hazardous materials (including hazardous substances) and hazardous wastes.

The applicable training courses required under the authority of the DOT through the Hazardous Materials Transportation Uniform Safety Act of 1990 and Docket HM-126-F are provided in detail in Part 8 of this manual. Information regarding scheduling for these courses can be obtained by contacting the Quality Training and Resource Center (QTRC).

The classroom training instructs the employee in applicable shipping requirements addressed by federal and state regulations and DOE orders. It is the responsibility of the authorized shipper's line manager to ensure that the shipper is provided the necessary supplemental training in specific packaging and shipping operations unique to the shipper's facility or area of responsibility.

For an employee to obtain signature authority once the required training is completed, the responsible Level 3 or 4 manager must initiate and submit a Request for Authority (to Ship Hazardous Materials/Wastes) (BC-9600-169). The Request for Authority to Ship Hazardous Materials/Wastes form can be obtained from Transportation Logistics.

Once the Request for Authority (to Ship Hazardous Materials/Wastes) form is received, it is reviewed by T&P. Safeguards will also review those requesting shipper status for SNM. Final approval of any new shipper is at the discretion of T&P Management. Transportation Logistics reviews and updates the authorized shippers list on a monthly basis, monitoring shipper performance and current training requirements. Shippers can be removed from the list based on frequency of infractions found during inspections, lapse of training, and/or lack of shipping activity within a six month time frame. This applies to hazardous materials, hazardous wastes, and radioactive material shipments. In order to maintain the shipper's

signature authority to ship materials, the shipper is required to make at least one onsite or offsite material shipment within a six month period from the initial signature authorization and every 6 months thereafter at a minimum. If a shipper fails to make a shipment within a six month period, the shipper will be removed from the list. To be reinstated and placed back on the list as a authorized shipper, the individual must retake and successfully pass the appropriate advanced class and examination administered by T&P Training personnel.

### 2.1.2 Other required training

Other training requirements exist for personnel who are involved with the preparation for transport, or transportation of hazardous materials and waste on public access roadways on the Hanford Site and/or to destinations outside the Hanford Site boundaries. Training and testing for all personnel involved in offsite transportation of hazardous materials (including radioactive) and waste is required. For detailed information on the course requirements, and the functions they affect Part 8, *Transportation Safety Training* provides comprehensive information. Drivers and shipping personnel have required specialized classes available such as Vehicle Inspection and Load tie-down training and Module 15 driver training that is offered by the Transportation & Packaging Department.

## 2.2 Receivers of Hazardous Material Shipments

Receivers of accountable nuclear material must be designated material balance area/item control area (MBA/ICA) custodians or alternates.

For other radioactive material and hazardous material shipments, a receiver may be anyone knowledgeable in the receiving group or a designate. The receiver does not have to be an authorized shipper.

Upon receipt of Type B, fissile, or HRCQ radioactive material shipments, the receiver notifies the sender and signs the receiving papers or the RSR indicating abnormalities, if any. Delay in receipt beyond a reasonable time is cause for initiating a prompt search for the shipment.

## 2.3 Compliance and Discrepancy Review

RSRs, Uniform Hazardous Waste Manifests (UHWs) and Hazardous Materials Shipment Records (HMSRs) are monitored for compliance verification. This along with physical inspection of the packages prior to transport, enables T&P to evaluate the effectiveness of training and/or application and address areas of concern that could enhance the present shipping program. Checklists are utilized for Hazardous Material, Hazardous Waste, and Radioactive Material Shipments and identify the specialized requirements that need to be met for these types of commodities as well as specialized requirements for the mode of transport used such as highway, air, etc. These checklists become part of the shipment records and allow for tracking and trending of shipment information for in-house performance assessment.

### 2.3.1 Onsite Shipment (North of the Wye Barricade - See Figure 2. of this section)

Transportation Logistics conducts an Onsite Shipment Record Review Program. This program, performed by area representatives reviews Hanford RSRs for onsite and internal hazardous waste shipment inspection checklists for errors or omissions. This data is maintained on a specially designed data base that tracks shipper and facility performance and is reviewed to evaluate trends and to identify areas where revisions to procedures and training may be needed. Onsite shipments also require Emergency Response information.

### 2.3.2 Offsite shipment (South of the Wye Barricade - See Figure 2. this section)

Outbound hazardous material shipments, (e.g., radioactive, nonradioactive hazardous and regulated samples) are inspected along with their associated shipping document (e.g., RSRs) at the point of origin before being released for transport to the 1100 Area for inspection by Transportation Logistics and final release to carriers for offsite transport. If potential regulatory non-compliances are noted during this inspection, the shipment is held until all items are reviewed and/or corrected. Changes to any package including marking, labeling, alterations to shipping papers or removal of, or changes to placarding can be authorized by Transportation Logistics, or the initiating shipper. Shipments will be in full compliance before being released for transport. This includes providing required Emergency Response information as required per 49 CFR 172.600.

## 2.4 Radioactive Shipment Checklist

All onsite and offsite radioactive materials shipments of fissile, LSA-II and Type A and above quantities are documented on a Radioactive Shipment Check List (form BD-7800-009,) to show the shipment and the RSR are properly completed. These forms can be found in Part 4 of this manual for *Radioactive Material Shipments*.

Routine shipments documented with Onsite Routine Radioactive Shipment Records are exempt from this requirement.

A facility may develop its own shipment checklist if required to contain facility specific information identified in specific procedures. It must however, at a minimum embody all the items as per example in Part 4 of this manual. All checklists must be reviewed and approved by T&P prior to use.

## 2.5 Tiedown Procedures

Title 49, Code of Federal Regulations (CFR), Part 177.834(a) requires that any package not permanently attached to a motor vehicle and containing flammable liquid, compressed gas, corrosive material, poisonous material, or radioactive material must be secured against movement within the vehicle under conditions normally incident to transportation. For those commodities not specifically addressed above, Section 393, Subpart I, in the Federal Motor Carrier Safety Regulations also provide supplemental requirements for "Protection against shifting or falling cargo." For Type B or Type A-Fissile radioactive shipments, tiedowns shall be applied in accordance with the packaging safety documentation (SARP or SEP) or Operations and Maintenance as appropriate. Training on Tie-Downs for hazardous materials

and inspection of vehicle and load securement based on these sections is available through the T&P department.

## 2.6 Packaging Procedures

RL requires written procedures for packaging, loading, transporting, and unloading be prepared for all shipments of hazardous materials transported on and offsite. These procedures must identify user responsibilities to ensure the package is used according to the applicable federal shipping regulations, the package safety analysis documentation, Package Operations and Maintenance Manual, and the administrative controls for onsite and offsite shipments, as applicable. The procedures should be detailed to the extent of defining individual steps involved and serve as a basis for a checklist of the main steps to ensure procedural compliance. These procedures shall be reviewed and approved by PE and QA.

## 2.7 Onsite Packaging Systems

Hazardous materials may be transported onsite in packagings used in full compliance with offsite transportation regulations. In this case, the shipment is made as though it was an offsite shipment, and all DOE/DOT/NRC packaging safety and/or certification requirements shall be met.

Alternatively, hazardous materials may be transported onsite in packagings that are specifically approved for onsite use.

PE provides onsite packaging development expertise and support. They are responsible for coordinating onsite package design engineering and preparation of safety analysis documentation (e.g., SARPs, SEPs,) and associated procurement specs. The following information describes the process, review, and approval requirements for onsite safety analysis documentation prepared by RFHS:

1. Initiation. New safety analysis documentation or reviews/changes to existing documentation are usually requested by a user organization by contacting the Manager, PE. PE makes routine revisions as necessary to reflect policy and regulation changes as well as maintains the site-wide packaging systems in service.
2. Preparation. PE coordinates the analysis, prepares safety analysis documentation, and guides the documentation through the review and approval process, including resolution of review comments and obtaining approval.
3. Control. Safety analysis documentation is prepared and maintained according to WHC-CM-6-1, EP-1.12. The engineering document system provides an accessible, auditable, and retrievable method for maintaining and changing safety analysis documentation. Permanent systems documentation is copy controlled.
4. Criteria. All onsite radioactive materials transportation systems shall meet the following acceptance criteria:
  - a. Radiation Levels. Radiation levels outside the packaging should meet the same acceptance criteria that apply to offsite packagings. However, as specifically

approved in the applicable SARP (onsite) or SEP, authorized radiation levels may be specified based on the Hanford Site Radiological Control Manual to account for ALARA and operational considerations.

- b. Contamination Levels Contamination levels outside the packaging should meet the same acceptance criteria that apply to offsite packagings including levels based on ALARA, operational considerations and those approved in the applicable SARP or SEP.
- c. Criticality Control Criticality control shall be specified in the applicable SARP (onsite) or SEP. The same acceptance criteria that apply to offsite packages shall be applied, except as modified to account for normal onsite transportation and credible onsite transportation accidents.
- d. Containment Radioactive material contents shall be retained during normal onsite transportation as specified, evaluated and approved in the applicable SARP or SEP. Evaluation criteria shall be in accordance with "Report on Equivalent Safety for Transportation of Radioactive Materials," WHC-SD-TP-RPT-001. Radioactive material contents shall be retained during accidents, as evaluated in dose consequence analyses in the SARP (onsite) or SEP, as follows:
  - (1) For onsite transportation accidents which have predicted annualized release frequencies of greater than one in a thousand, predicted doses due to loss of contents shall not exceed 200 mrem to any onsite individual or 10 mrem to any offsite individual.
  - (2) For onsite transportation accidents which have predicted annualized frequencies of between one in a million and one in a thousand, predicted doses due to loss of contents shall not exceed 5000 mrem to any onsite individual or 500 mrem to any offsite individual.
  - (3) For onsite transportation accidents which have indeterminate annualized release frequencies, predicted doses due to loss of contents shall not exceed 200 mrem to any onsite individual or 10 mrem to any offsite individual.
  - (4) For accidents which have predicted annualized release frequencies between one in a million and one in ten million, predicted doses due to loss of contents shall not exceed 25 rem to any offsite individual.
- 5. Review and Approval Cycle. Safety analysis documentation is reviewed and approved and changed according to WHC-CM-3-5, Section 12.7. All SARP's (onsite) and permanent SEP's shall be reviewed and updated as necessary at least every five years, and shall have controlled distribution. Existing SARP's & SEP's are grandfathered

based on their original safety basis/authorization for up to five years based on the SARP upgrade plan (WHC-SD-TP-PLN-006). Additional reviews and approvals are identified as follows where:

D = DOE  
Q = Responsible QA Organization  
S = Responsible independent safety review organization

- Initial release, or major revisions (as determined by PE Manager) where a SARP (onsite) or SEP applies to packaging intended for onsite shipment of HRCQ of radioactive material. **SQD**
- Initial release and modifications to a SARP (onsite) or SEP not addressed by criterion above that applies to Type B or Type A/LSA Fissile packaging intended for onsite shipment. **SQ**

SEP (for non-rad hazmat; LSA, Type A, etc) **SQ**

6. Approval for Editorial Changes. Inconsequential editorial changes to a safety analysis document may be approved by the cognizant engineer and cognizant manager.
7. Transportation Hazard Index and Quality Level. The safety classification system and requirements instituted by DOE is for application to facility design, specification, construction and operation of facilities. However, it does not have direct application to transportation of radioactive and hazardous materials which are governed by different requirements for both onsite and offsite shipments. Offsite shipments are governed either by NRC or DOT regulations. Onsite shipments between facilities of hazardous material have no such governing regulations. Consequently, a graded classification structure based on content hazard has been developed for onsite packaging systems that establishes a system both analogous to and compatible with the present safety classification system and offsite shipment regulations.

The Transportation Hazard Indicator (THI) is assigned to represent the relative safety significance of an onsite packaging system. This indicator is assigned based on the hazard of the authorized contents of the packaging system. A THI of 1 represents the highest safety significance and greatest content hazard; a THI of 4 representing the least safety significance, or the least content hazard category.

#### Definition of Requirements for each THI:

THI-1: This represents the highest level of hazard from the contents. A packaging system assigned this level transports material that has the potential of causing a dose consequence, to an individual, in excess of 25 rem at the Hanford site boundary if fully released.

THI-2: This represents the second highest level of hazard from the contents. A packaging system assigned this level transports material that has the potential of causing a dose consequence, to an individual between 0.5 rem and 25 rem at the Hanford Site boundary, or greater than 5 rem within the site, if fully released.

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**THI-3:** This represents the second lowest level of hazard from the contents. A packaging system assigned this level transports material that has the potential of causing a dose consequence, to an individual, of between 0.01 rem and 0.5 rem at the Hanford site boundary or between 0.2 rem and 5 rem within the site, if fully released.

**THI-4:** This represents the lowest level of hazard from the contents. A packaging system assigned this level transports material that has the potential of causing a dose consequence to an individual less than 0.01 rem at the Hanford site boundary or less than 0.2 rem within the site, if fully released.

*Quality Level:*

The alphanumeric Quality Level, "QL" defines the significance to safety of each component of a packaging system. QL's are defined as follows:

- QL-A:** Critical impact on safety and associated functional requirements: items or components whose single failure or malfunction could directly result in an unacceptable condition of containment, shielding, or nuclear criticality control.
- QL-B:** Impact on safety and associated functional requirements: components whose failure or malfunction in conjunction with one other independent failure or malfunction could result in an unacceptable condition of containment, shielding, or nuclear criticality control.
- QL-C:** Minor impact on safety and associated functional requirements: components whose failure or malfunction would not reduce packaging effectiveness and would not result in an unacceptable condition of containment, shielding, or nuclear criticality control, regardless of other single failures.

*THI/QL Table:*

The THI/QL Table lists the QL-THI designator. Each onsite packaging system is assigned one THI based on the authorized contents. Quality Levels are assigned based on the relative safety significance of packaging components. The QL-THI designator establishes the relative safety significance of components, and is used as part of the graded approach to determine quality requirements.

Transportation Hazard Indicator (THI)	Quality Level		
	A	B	C
1	A-1	B-1	C-1
2	A-2	B-2	C-2
3	A-3	B-3	C-3
4	A-4	B-4	C-4

## 2.8 Offsite Packaging Systems

All offsite radioactive material packages and their use must comply with the applicable DOT/DOE/NRC regulations. Contents shipped must be in accordance with the authorized contents section of either the appropriate DOE/NRC COC and SARP for certified packages or the 49 CFR references for authorized packages.

Only a few radioactive material packages are regularly used by site customers; but for other packages for special shipments, arrangements may have to be made with the package owners as to availability and use. Authorized radioactive material packages are listed in 49 CFR. Packagings certified by NRC and/or DOE are listed in NUREG-383 ("Directory of Certificates of Compliance for Radioactive Materials Packages") and the "Directory of DOE Certificates of Compliance for Radioactive Materials Packaging."

Before a Hanford site contractor may use a certified package, DOE must be listed as a user of that package. The user must possess a copy of the COC for the package and have the drawings and other documents referenced in the COC relating to the use and maintenance of the package. Approved designations for the initial release or modification to a SARP for Type B or Type A/LSA Fissile offsite packaging. Contact PE for certification and design support. **SQD**

DAPs associated with demonstrating the safety and/or regulatory compliance of packaging intended for shipment of Type A or LSA quantities of radioactive material or for shipment of non-radioactive hazardous material. **SQ**

## 2.9 Package Utilization

Once a safety analysis document is approved, copies are sent to the affected organizations, including operations and applicable facility engineering, to incorporate the administrative controls from the safety analysis document into the affected operating documents. User organizations must obtain PE review of all operating procedures that incorporate instructions or administrative controls found in COCs, SARPs, SEPs, DAPs, DOT exemptions, and federal and state packaging requirements to ensure they are properly incorporated and in compliance with the packaging approval.

Onsite packages currently approved for onsite use are cataloged and described in the Hazardous Materials Packaging Directory maintained by POD on the INTERNET (<http://www-proxy.rl.gov:1050/pss/t&p/t&phome.htm>). New packages are added to the directory as they are developed and approved. Permanent SEP's and SARP's are copy controlled.

## 3.0 DOE ORDER COMPLIANCE

### 3.1 DOE 460.1, Packaging and Transportation Safety

1. Contractors, who are subject to DOT jurisdiction, shall prepare each package and shipment of hazardous materials for offsite shipment in compliance with the Hazardous Materials Regulations of the DOT [Title 49 Code of Federal Regulations (CFR) Parts 106-199] and the applicable Tribal, State, and local regulations not otherwise

preempted by DOT. Offsite shipment of hazardous materials on DOE vehicles operated by contractors which are State Agencies (not otherwise subject to DOT jurisdiction) shall follow the Hazardous Materials Regulations of DOT and the applicable Tribal, State, and local regulations not otherwise preempted by DOT. This order will replace portions of 1540.2 and 5480.3 when contract is modified to include this new order.

2. All offsite transportation operations are accomplished as required in Chapter II, "Transportation Operations," paragraphs 1.a through 9.c.

### **3.2 DOE 460.2, Departmental Materials Transportation & Packaging Management**

1. Identifies DOE policies and requirements to supplement applicable laws, rules, regulations, and other DOE Orders for materials transportation and packaging operations. This order will replace 1540.1A, 1540.2, and 1540.3A when contract is modified and approved. Until such time, site contractors are to subject to the above referenced orders.

### **3.3 DOE 1540.2, Hazardous Materials Packaging for Transport - Administrative Procedures**

1. Approval from DOE-HQ is obtained for alternatives to DOE regulations and procedures. A detailed report is provided through RL discussing reasons why the alternative should be granted.
2. All transportation and packaging procedures must meet the requirements of Chapters I through XII and the requirements for SARP preparation in DOE 5480.3.
3. All radioactive material shipments, hazardous material shipments, and hazardous waste shipments made offsite are made in packages reviewed and approved as prescribed in Chapter I, "General," paragraphs 1.2.a through 1.3.d. In summary, these paragraphs address the elements of the review and approval process for radioactive and hazardous material packagings.
4. All packagings used to transport those radioactive materials for which packaging design approval is required by DOE Order must meet the requirements of Chapter II, "Department of Energy Certificates of Compliance," paragraphs II.1 through II.2.j. In summary, before issuing a DOE COC, a SARP is prepared by the package designer in the format described in NRC Regulatory Guide 7.9. The SARP is also prepared, submitted for review and approval, and distributed according to the requirements of these paragraphs.
5. All DOT exemptions, renewals, and part-to-exemptions are obtained via the procedure requirements stated in Chapter III, "Department of Transportation Exemptions," paragraphs III.1 through III.2.c.[3].
6. Approval for all shipments that require alternatives to the requirements of DOE 5480.3 is granted using the procedures prescribed in DOE 1540.2, Chapter IV, "Department of Energy Alternatives."

7. DOE packagings that require a Nuclear Regulatory Commission (NRC) Certificate of Compliance are subject to the requirements of Chapter V, "Nuclear Regulatory Commission Certificates of Compliance," paragraphs V.2.a. In summary, these paragraphs address the procedure for obtaining an NRC COC.
8. Radioactive material shipments exported to or imported from foreign countries must have a Certificate of Competent Authority documenting approval by the International Atomic Energy Agency (IAEA) as prescribed in Chapter VI, "International Atomic Energy Agency Certificates of Competent Authority," paragraphs VI.1, through VI.2.c.(3). In summary, these paragraphs address the procedure for obtaining a Certificate of Competent Authority.
9. All offsite shipments utilizing packagings that contain Type A quantities of radioactive material are certified to meet DOT Specification 7A requirements according to Chapter VII, "Department of Transportation Specification 7A Packaging Certifications," paragraphs VII.1 through VII.2.d.
10. All offsite shipments utilizing DOT packagings authorized for Type B quantities of radioactive material are approved for use by DOE and its contractors according to Chapter VIII, "Department of Transportation Type B Specification Packaging," paragraphs VIII.1 through VIII.2.c.
11. All radioactive materials certified as special form must comply with the DOT regulations as prescribed by Chapter IX, "Special Form Certification," paragraphs IX.1 through IX.2.b.(4). In summary, these paragraphs address requirements for obtaining a special form certification.
12. DOE explosive materials, prior to shipment, are assigned DOT hazard classifications and registered with the DOT as required by Chapter XI, "Explosive Materials," paragraphs XI.2.a through XI.2.d.(3). In summary, new explosives, including explosive compounds, mixtures, or devices may be transported if they have been examined, classified, and approved for shipment by DOE.
13. Chapter XII, "Rulemaking Requests for Hazardous Material Packaging," are followed to ensure that comments or proposed changes to DOT, NRC, or IAEA regulations are submitted through appropriate DOE channels.

### **3.4 DOE 232.1, Occurrence Reporting and Processing of Operations Information**

All occurrences involving transportation and packaging operations are reported, reviewed, and conducted according to the requirements of DOE 232.1. In summary, this order establishes the requirement to review and evaluate occurrences associated with DOE facilities and operations.

### **3.5 DOE 5480.3, Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes**

1. All shipments made offsite must meet requirements established in Section 7, "Requirements," paragraphs 7.a through 7.f.[2]. In summary, all shipments must be in

compliance with the Order and applicable requirements of the DOT, and applicable packaging standards of the NRC. In addition, meet special controls for the shipment of plutonium.

2. All radioactive shipments made offsite must be made in packages that meet the packaging standards established in Section 8, "Packaging Standards" (except paragraphs 8.a(1), 8.a(4), 8.c(1), 8.c(2), 8.c(3), 8.d, 8.e., 8.f., and portions of 8.g which were delegated by DOE Notice, [see DOE N 5480.3, dated 3-9-88]). In summary, these paragraphs address standards for all radioactive materials packagings.
3. All QA procedures associated with radioactive material packagings must meet the quality requirements established in Section 9, "Quality Assurance Procedures for the Fabrication, Assembly, and Testing of Offsite Shipping Containers," paragraphs 9.a.(1) through 9.b.(9). In summary, these paragraphs require establishment of procedures and a comprehensive QA program similar to what is required by 10 CFR 71, Appendix H, "Quality Assurance."
4. All shipments must be made under operation procedures according to Order Section 10, "Operating Procedures," paragraphs 10.a.(1) through 10.g.(4). In summary, procedures must cover topical items including assumption of unknown properties, preliminary determinations, routine determinations, records management, back-up technical documentation, and notification procedures.

NOTE: All remaining sections of this DOE Order have been deleted by DOE Notice (see DOE N 5480.3, dated 3-9-88).

### 3.6 DOE 5632.1C, Protection & Control of Safeguards and Security Interests

All offsite shipments of irradiated reactor fuel are accomplished according to the objectives, requirements, and plans identified in DOE 5632.1C. Paragraph 5.(d) All offsite shipments of SNM and vital equipment are accomplished according to the requirements of DOE 5632.1C which provide the policy for protection of SNM and vital equipment from theft, sabotage, or other hostile acts which might cause adverse impacts on national security or on the health and safety of the public.

### 3.7 DOE 5633.3B, Control and Accountability of Nuclear Materials

All nuclear material is controlled and accounted for according to the requirements of DOE 5633.3, Chapters I through III, (specifically II.5, I.6, III.3, and III.4). In summary, DOE 5633.3 contains the requirements for control of nuclear material (e.g., SNM) during the shipment or transfer process.

### 3.8 DOE 5700.6C, Quality Assurance

All transportation and packaging operations to which quality assurance requirements apply must meet the requirements of DOE 5700.6C. In summary, the requirements of DOE 5700.6C provide requirements for developing and implementing quality assurance programs. The QA requirements for the RFHS transportation and packaging program are

found in RFS-IP-0705, *Quality Assurance Program Plan for the Hazardous Materials Transportation and Packaging Program*.

**3.9 RL Letter 95-SWT-186. 3/29/95 from RL Director of Procurement Services Division.**  
(Replacement guidance for RLID 5480.3 and RL 5480.1 Change 1, Chapter III.)

All radioactive material at the Hanford Site is prepared, packaged, and transported in approved DOT/DOE/NRC packages whenever technically and economically practicable for onsite shipments. An equivalent degree of safety to DOT/DOE/NRC approved packages is provided for onsite shipments (i.e., packages), if DOT/DOE/NRC approved packages are not technically or economically feasible. DOE Orders and other statutory requirements are still in effect for shipments that invoke offsite regulations.

**4.0 REFERENCES**

DOE, "Directory of DOE Certificates of Compliance for Radioactive Materials Packaging."

DOE 232.1, "Occurrence Reporting and Processing of Operations Information."

DOE 460.1A, "Packaging and Transportation Safety."

DOE 460.2, "Departmental Materials Packaging for Transport - Admin. Procedures."

DOE 1540.2, "Hazardous Material Packaging for Transport - Admin. Procedures."

DOE 5480.3, "Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes."

DOE 5632.1C, "Protection and Control of Safeguards and Security Interests."

DOE 5633.3B, "Control and Accountability of Nuclear Materials."

DOE 5700.6C, "Quality Assurance."

NUREG-0383, "Directory of Certificates of Compliance for Radioactive Materials Packages."

RL 95-SWT-186, Cancellation of RLID 5480.3 and RL 5480.1 - Guidance letter.

Title 10, *Code of Federal Regulations*, "Nuclear Regulatory Commission."

Title 49, *Code of Federal Regulations*, "Transportation."

WHC-CM-1, *Company Policies and Procedures Manual*.

WHC-CM-2-2, *Materials Management Manual*.

WHC-CM-3-5, *Document Control and Records Management Manual*.

WHC-CM-6-1, *Standard Engineering Practices*, EP-1.12, "Supporting Document Requirements."

WHC-EP-0063, *Hanford Site Solid Waste Acceptance Criteria* (latest revision).

WHC-SP-0364, *Hazardous Materials Packaging Directory*.

RFS-IP-0705, *Quality Assurance Program Plan for the Hazardous Materials Transportation and Packaging Program*.

Figure 1. Hanford Site Map.

